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DISEASE OF THE SACRO-ILIAC SYNCHONDROSIS.

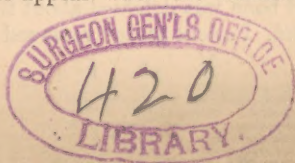
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CASE I.—A. B., aged four years, was admitted into St. Mary's Free Hospital for Children January 31, 1877. She is a perfectly healthy looking child. Family history good. Her mother gives the following account of her illness. Last August she began to limp a little, especially when she walked fast or attempted to run; at this time she did not complain of any pain. Four weeks later she complained of pain in her left knee. She was then seen by a physician, who said that she had disease of the left hip-joint. During the winter her lameness gradually increased, and another physician who had charge of her inclined to the opinion expressed by the former attendant, although he stated that there was an absence of any tenderness, heat, or swelling about the joint. On admission, the following was her condition. There was no change in the contour of the parts about the left hip-joint; no atrophy of the muscles. Motion at the hip-joint was perfectly free, smooth, and painless, except when carried to extreme rotation inwards or outwards, or forced flexion, when she complained of pain between the trochanter major and the sacro-iliac joint, and at the knee. There was no lordosis when the thigh was extended on the pelvis, and no tilting of the latter. Pressure on the trochanter major, or striking the sole of the foot with the limb in an extended position, caused pain behind the hip-joint. Pressure on the left ilium, either at right angles to the body, or backwards, caused pain at the left sacro-iliac synchondrosis. There was pain on pressure over the left sacro-iliac joint. She complained, when up, of pain on the outer aspect of the left thigh, lower portion of left leg, and at the knee. There was no swelling or tenderness over the hip-joint below Poupart's ligament, nor behind the trochanter major. When in bed she could flex, extend, and rotate the thigh without any pain. In walking there was nothing characteristic in the way she carried herself, except that she threw the weight of her body on the sound side. When in bed she had no pain day or night, but always suffered when on her feet in the localities mentioned above. There was no real, or apparent, difference in the length of the lower limbs.

March 29. Has been kept quiet in bed. To-day extension was applied.

April 4. Since the 29th she has been crying much from pain in the left thigh, knee, but especially about the lower portion of her leg. On removing the weight it passes off, only to appear when the extension is put on again.



23d. Plaster of Paris bandage applied around the pelvis, but it had to be removed in a few days on account of the pressure.

June 6. Patient fell out of bed last night, and to-day complains of pain in her left thigh, and upon motion; the parts are swollen and tender.

7th. She was to-day removed from the hospital.

CASE II.—D. W., aged five years, was admitted into St. Mary's Free Hospital for Children April 7, 1877. The following imperfect history is all that could be obtained. Last October he complained of pain at intervals about his right hip, which gradually increased. He became lame, and was supposed to have disease of the hip-joint. He has always rested well at night, and suffered no pain when in the recumbent position. There is no history of any fall or injury. On admission, the following was his condition. When standing there was a marked difference in the contour of the hips: the right was bulged out, so as to form a curve beginning at the lower ribs, having its greatest point of convexity just below the crest of the ilium, then curving inwards and ending at the lower border of the nates on that side, which was lower, and more pointed than on the left side. This bulging out was caused partly by his position, and partly by an abscess which occupied the gluteal region. The right limb was atrophied, as well as the muscles forming the gluteal group. Motion at the hip-joint was perfectly free, smooth, and painless, except in forced flexion and rotation, when he complained of pain at the sacro-iliac joint. There was no lordosis when the thigh was extended on the pelvis. Pressure on the trochanter major, or striking on the sole of the foot, when the limb was extended, caused pain at the right sacro-iliac synchondrosis, and any movement of the ilium of that side on the sacrum caused the patient to cry out from pain. There was exquisite tenderness over the right sacro-iliac joint. The patient could flex, extend, and rotate the limb when in bed. There was no swelling or tenderness over the joint below Poupert's ligament, nor behind the trochanter major. He did not complain of any pain day or night when in bed, but standing and walking were almost impossible on account of the pain. He complains of no pain in the thigh, knee, or leg.

April 9. Abscess in gluteal region aspirated, but only a few ounces of pus obtained.

30th. Several attempts have been made to evacuate the abscess by aspiration, and, although several ounces of pus have been removed each time, yet the abscess did not seem to be emptied. To-day a free incision was made through the gluteal muscles, and eight or ten ounces of matter evacuated: there seem to have been two abscess cavities, one superficial, the other deep below the gluteal muscles, and in aspirating only the former was reached. For the past week the thigh has gradually become flexed on the pelvis, and cannot now be extended to more than a right angle. There was also a swelling above the crest of the ilium, but no fluctuation could be detected. There was also an impulse communicated to the gluteal abscess when the patient coughed or cried.

May 5. As the opening in the gluteal region showed a tendency to close, a drainage tube was inserted.

12th. Fluctuation was to-day felt in the swelling above the crest of the ilium, and it was opened.

17th. Water injected into the abscess above the crest of the ilium flows out through that made in the gluteal region, passing within the pelvis. Dead bone was detected about the sacro-iliac joint.

19th. Patient to-day removed from the hospital.

In reading the histories of these two cases, it will be noticed that there are certain symptoms common to both, and that in other points they differ. Gradually increasing lameness, pain on pressure over the sacro-iliac synchondrosis of the diseased side, pain on pressure over the trochanter major, as well as on striking the sole of the foot while the limb is extended, were symptoms common to both cases. In Case I. pain was complained of in the thigh, knee, and leg; while in Case II. the pain was confined to the parts about the diseased joint. In Case I. there was at no time any flexion of the thigh on the pelvis; while in Case II. after a time the thigh became flexed. Case II. was complicated by abscesses, extra- and intra-pelvic; while Case I. presented none. In both cases forced flexion and rotation caused pain; while any motion, short of being carried to the extreme, was free and painless.

Looking at these two cases again, it will be noticed that in some points they resemble disease of the hip-joint: in fact, both patients were sent to the hospital for treatment of disease of that articulation. Pain on pressure over the trochanter major, as well as on striking the sole of the foot with the limb in an extended position, pain at the knee, as in Case I., pain on motion at the hip-joint when the pelvis was not fixed, are commonly looked upon as almost diagnostic of disease of the hip-joint; but free and painless motion at the hip-joint when the pelvis is fixed, as well as the absence of any swelling or tenderness on pressure below Poupart's ligament in front, or behind the trochanter, are conditions **not** compatible with disease of that articulation.

Disease of the sacro-iliac synchondrosis is quite rare. I cannot find a case reported in the record-books of the New York Hospital; but three specimens of disease of this joint have ever been presented at the New York Pathological Society, and but two are recorded in the reports of the London Pathological Society. Standard works on surgery have but little to say on this subject; in fact, in many no mention is made of disease of this joint, if we except the last edition of Erichsen's *Surgery*, where a clinical lecture published in the *Lancet* in 1869 is reproduced. Hilton, in his lectures on "Rest and Pain," has treated the subject more thoroughly than any other English writer. Mr. C. Heath has reported some cases in the *British Medical Journal*, January, 1876. In the French medical literature we find disease of this articulation more frequently mentioned: the theses of Girauld de Nolhac, in 1840; Joyeaux, 1842; Boissarie, 1862; Delens, 1872; and Brugel, 1877, as well as the surgical works of Nélaton, Follin, and Fano should be mentioned.

The two cases occurring in my own practice, together with fifty-six collected from foreign and domestic medical journals, form the basis of this paper.

The following table shows the age and sex in the fifty-eight cases in which they are noted:—

Age.	Males.	Females.
Under 10 years of age	4	3
Between 10 and 20 years of age	4	3
“ 20 “ 30 “ “	9	9
“ 30 “ 40 “ “	3	4
“ 40 “ 50 “ “	2	3
Adults	7	5
Over 60 years of age	1	0
Age and sex not given	1	
	1	30
		27—58

The youngest was four years of age, the oldest sixty-one. The disease occurred in 25 cases on the right side, in 24 on the left, in two it was double, and in 7 the side was not mentioned.

In considering the subject of disease of the sacro-iliac joint, a distinction should be made between a certain class of cases connected with the puerperal state, described as simple relaxation of the symphysis, and those more profound changes due to direct injury, or secondary to inflammation of the soft parts within the pelvis, although from a careful reading of the histories of some of the puerperal cases, it would appear that what was looked upon as a simple relaxation at a former pregnancy, has been followed, at a later confinement, by serious changes in the articulation. The consideration of cases belonging to the latter class would naturally find a place in a paper of this kind, while those cases of simple relaxation should be excluded.

Cause.—Of the 30 cases occurring among males, in 12 no cause was assigned, five were due to an injury, one to a strain in lifting a heavy weight, four to gonorrhœa, one to rheumatism, five were secondary to Pott's disease, one case followed measles, and was assigned to “cold.” In some of the cases due to gonorrhœa, a subsequent contraction of the disease was followed by renewed trouble in the sacro-iliac articulation.

Of the 27 cases occurring among females, in 12 no cause was assigned, 11 were connected with the puerperal state, two were due to an injury, one to a strain from carrying a heavy weight, and one followed continued fever. Of the 11 cases dependent on parturition, five were subsequent to a tedious labour, due either to a large child, or a contracted pelvis, in three pyæmic abscesses were found in the joint, one case was secondary to phlegmasia dolens, one to a uterine phlebitis, one to phlegmonous inflammation of the pelvic fascia. In one case the sacro-iliac joint was injured during the delivery of a dead child with forceps; both the patient and physician heard a distinct cracking; this was immediately followed by intense pain and swelling at the left sacro-iliac joint, and later, by both extra- and intra-pelvic abscesses. In one case there was a history of pain and difficulty in walking, subsequent to a previous confinement; this was aggravated by a second pregnancy, and was followed by displacement of

the ilium on the affected side. Nine of these eleven cases were accompanied by abscesses. Martin and others have observed disease of the sacro-iliac synchondrosis generally after the birth of large children, or in narrow pelves. (*Berl. Klin. Woch.*, Sept. 27, 1875.)

The course of the disease may be either acute or chronic. Fagan has reported a case in a child following a fall, and although accompanied by extra- and intra-pelvic abscess, complete recovery took place at the expiration of seven weeks.

The occupations of the patients is given in 21 cases. Six cases occurred among soldiers, four were labourers, one was a carpenter, one a tradesman, one a student, one a cook, one a washerwoman, three are spoken of as "ladies." Hahn has observed three cases among tailors. It would appear from the above that the disease is more common among the labouring class.

Symptoms.—The symptoms of disease of the sacro-iliac synchondrosis may be studied under the following heads: I. Pain; II. Lameness; III. Swelling; IV. Abscess; and Erichsen adds a fifth, alteration in the shape of the limb.

Pain is constantly present, except, perhaps, in the earliest stage of the disease, when the patient bears any weight upon the affected side, or when any motion is communicated to the joint. It may be of two kinds, (*a*) pain at, or about, the diseased joint, (*b*) pain referred to a distant part, as down the limb of the affected side, (*c*) or pain may be complained of in both localities, and, in a few cases, down the limb of the opposite side.

In Case No. II. the pain was confined to the joint, and was always present when any weight was borne upon, or motion communicated to it. When the patient was quiet in bed, he was perfectly comfortable, and could flex, extend, and rotate the thigh of that side, but standing and walking were almost impossible on account of the acute pain. In 14 cases the pain is stated to have been confined to the gluteal region, as "behind the hip," "at the side of the pelvis," "at the sacro-iliac joint," "about the hip but not in it." In Case I., recorded in this paper, no pain was complained of at the affected joint, unless pressure was made directly upon it, but when standing or walking pain was complained of on the outside of the thigh, in the knee and leg. In five cases pain was complained of at the knee and lower portion of the thigh, in two cases in the thigh and leg, in one case intense pain in the calf was all that was complained of, in five cases in the thigh to the knee-joint. In none of the above cases was there any pain at the diseased joint unless pressure was made upon it. In five cases pain extended from the diseased joint down to the knee and leg, in nine it was at the joint and along the course of the sciatic nerve, in three it was in the joint and down the anterior or inner aspect of the thigh to the knee, in one case there was pain in the joint and over the abdomen, and

in one in the joint. Pain in these cases followed the sciatic, obturator, gluteal, and anterior crural nerves. In those cases where the pain was in the course of the anterior crural nerve, there existed intra-pelvic abscesses, and in the case where there was pain over the abdomen, symptoms of disease of the sacro-iliac joint did not appear until later, although they were carefully looked for.

Heath, Guèniot, and Mason, have each reported a case where there was pain in the opposite limb to the one corresponding to the diseased joint. In each of these cases there existed an intra-pelvic abscess with pressure on the sacral plexus (at least in one). Boissarie makes mention of the same symptom.

The pain in sacro-iliac disease is almost always greatly relieved, and often entirely ceases, when the patient assumes the recumbent position. Pain is always present, in cases at all advanced, when the patient is standing, or when any weight is borne by the joint. Gosselin mentions a case, due to gonorrhœa, where the pain was worse at night when the patient was in bed.

Pain was excited by traction in Case I., and Larrey noted the same fact in one of his patients.

There is an entire absence of those starting pains at night, so characteristic of hip-joint disease.

The mode of *accession* is stated in 32 cases ; in fourteen it was gradual, and in eighteen sudden. In the former class, vague pains after a fatiguing walk, a sense of weariness, or weakness in the back, obtuse pain about the gluteal region, the feeling of a want of support in the lower part of the body, pain of a rheumatic character, were complained of. In the latter class, the patient may suddenly be seized with acute pain so as to be unable to move, or it may come on after a sudden movement in bed, or immediately after an injury or strain ; in a word, it may resemble, in its mode of accession, inflammation of any other joint.

Lameness is a constant symptom ; early in the disease it may be slight, or only appearing after a fatiguing walk or sudden exertion, it soon increases, until, in some cases, locomotion is impossible. The gait is unsteady ; when the patient is able to walk, the foot is not placed firmly on the ground. There is not, as a rule, any change in the position of the foot. In standing, the whole body is thrown over on the sound limb in order, as much as possible, to relieve the inflamed joint from all pressure, giving to the affected side of the pelvis a rounded-out appearance ; this is often increased by the presence of an abscess under the gluteal muscles.

Tenderness over the sacro-iliac synchondrosis is always present. There may be a diffuse tenderness on pressure over the whole gluteal region, but it gradually increases as you approach the joint, where it will be most marked. In some cases the joint is exquisitely tender, while in others,

quite firm pressure is borne with but little complaint; comparison with the sound side will, however, show a difference.

Motion at the hip-joint, on the affected side, is free, smooth, and painless, when the pelvis is fixed, except when carried to extreme flexion and rotation, provided there is an absence of intra-pelvic abscess. In 29 cases the state of the joint in this respect is mentioned, and in all these cases it was good.

In 11 cases the thigh was more or less flexed on the pelvis, and, in a few, adducted. In Case II., at the time of admission, movements at the hip-joint were normal, and there was no flexion; but after a time the thigh gradually became flexed on the abdomen, and shortly after an intra-pelvic abscess was discovered. In nine of these eleven cases the presence of an intra-pelvic abscess is mentioned, and in two no attempt seems to have been made to decide this point. It would seem highly probable, from the above, that flexion of the thigh would strongly indicate the existence of an abscess within the pelvis. The presence of intra-pelvic abscess is noted in 15 cases, but the position of the thigh is not mentioned.

Erichsen, Delens, and others, speak of a change in the apparent length of the limb on the affected side. Mr. Erichsen makes the following statement:—

“Alterations in the shape of the hips and length of the limb are early, and marked from the very commencement of the disease; the limb on the affected side will seem to be longer than on the sound side, due to a tilting forwards, and rotation of the pelvis dependent on swelling of the articulation.” Heath also mentions this apparent lengthening of the limb as one of the prominent symptoms, yet in the three cases which form the subject of his clinical lecture, the state of the limb is mentioned only in one, and in this he states that “*there was no change*,” notwithstanding the fact that these were of some duration, and accompanied by intra- and extra-pelvic abscesses.

In the two patients whose history is given in this paper, there was no change in the length of the limbs. In 15 cases the state of the limb is mentioned, in seven there was *no change*, three were apparently *lengthened*, and five apparently *shortened*. Nélaton states that the limb on the affected side may be apparently lengthened, and that this elongation may be succeeded by apparent shortening. It would therefore seem that this change in the length of the limb is not as constant a symptom as some writers would lead us to suppose. This change in the apparent length of the limb, when it does exist, is due to alterations taking place in the ligaments, and tissues about the joint, which allow the ilium to be rotated downwards and forwards, in those cases where lengthening is found, and upwards and backwards where there is shortening. The distance from the anterior superior spine of the ilium to the internal malleolus, remains

the same. Hahn mentions a case where there was a deviation inwards and backwards, of the right thigh (the diseased side), so that the right knee crossed behind the left, the right ilium was displaced inwards, and the sacro-iliac joint ankylosed. There is no lordosis, nor twisting of the pelvis, so constant a symptom of disease of the hip-joint.

Martin and Collineau mention two cases of disease of the hip-joint, complicated with disease of the sacro-iliac synchondrosis of the affected side. Mr. Holmes seems to look upon it as not an unusual complication.

Verneuil reports a case where there existed hyperæsthesia of the limb of the diseased side. Guèniot, where both limbs were similarly affected; and Hilton, where there was hyperæsthesia of the calf. In the first two cases there were abscesses within the pelvis. Joyeaux mentions a case where there was paralysis of motion and sensation in the limb of the diseased side, with extensive collection of matter within the pelvis.

Sayre, in his work on "Orthopedic Surgery," page 328, makes the following statement: "While the inflammatory process is going on, the patient will complain of difficulty in making water, difficulty in having a movement from the bowels, and more or less pain in the bowels; in short, the same class of symptoms referable to the front part of the body of which the patient complains who has Pott's disease of the spine." The distribution of the nerves irritated is not "to the front of the body," and difficulty in making water and difficulty in having a movement from the bowels are *not* mentioned as symptoms of sacro-iliac disease in the 58 cases analyzed, and I can see no anatomical reason for their existence, except when the bladder or rectum is pressed upon by an abscess.

Pain in the bowels is, however, a prominent symptom of Pott's disease in the dorsal region, and difficulty in micturition and defecation is associated with pressure on the cord.

Abscesses were found in 37 cases; in 16 no mention is made on this point; and in 5 none could be found. They may be either extra- or intra-pelvic; may be confined to the joint, or may exist in all these localities.

Abscesses, extra-pelvic.—Of these there were 5 cases: it may be found over the joint, first as an oblong swelling, not movable on the bone, painful upon pressure; later the pus may extend under the gluteal muscles towards the trochanter major, but not reaching it, there is usually a distinct sulcus between the abscess and that bone. The pus may extend backwards so as to cover the posterior surface of the sacrum, or downwards.

In Case II. there were two abscess cavities: one superficial, the other deep under the gluteal muscles, probably communicating through a small opening. Guèniot found a similar condition in one of his cases; and Boissarie, Fano, and Follin refer to the same fact. Muston found a sinus extending from the groin around the hip-joint on to the dorsum of the ilium.

In six cases, at post-mortem examination, the joint was found filled with pus.

Abscesses, intra-pelvic.—Of these there were ten cases. The pus may be between the bone and the iliac fascia; may be in the psoas muscle; may extend backwards so as to cover the anterior face of the sacrum. In case both joints are diseased, it may occupy both psoas muscles. The abscess may discharge in the groin, per rectum, or vaginam.

Abscesses, both extra and intra-pelvic.—Of these there were sixteen cases. They may either communicate through the sacro-sciatic notch, or be distinct, one passing down behind the iliac fascia, or in the psoas muscle, the other being beneath the gluteal muscles. In Case II. a distinct impulse was communicated to the abscess under the gluteal muscles in coughing. Heath observed the same symptom in one of his patients. W. Morrant Baker reports a case in which a gluteal abscess, due to disease of the sacro-iliac articulation, was found to contain blood which came from within the pelvis through the sacro-sciatic notch; the hemorrhage was so profuse that he was compelled to ligate the common iliac. The hemorrhage was supposed to come from a branch of the iliac artery that had ulcerated.

Mustin mentions a case where both lower extremities became enormously œdematous from plugging, first of the iliac vein of the left side, then of the right. At post-mortem examination the iliac vessels were found to be firmly imbedded in the walls of a large abscess; the left vein was filled by a fibrinous clot which entirely obliterated its cavity, and extended down the vein on the opposite side.

In two cases dead bone came away through an abscess which discharged per rectum. Erichsen mentions having met a tympanitic abscess from the passage of flatus into an abscess discharging per rectum.

In some cases crepitus was detected in the joint.

Pathological Anatomy.—The articulation between the sacrum and ilium comes under the class of amphiarthrodial joints. The articulating surfaces are formed of fibro-cartilage lined by a partial synovial membrane; the bones are connected together by external and internal ligaments of great strength. Changes may be found in all these tissues. Erichsen found erosion of the cartilage in a case of six weeks' duration; while in a case of two years' standing there existed degeneration of the cartilage with but slight change in the ligaments and bones. Stoll found the ligaments destroyed, and the articular surface of the bones carious. Hahn found extensive disease of the bones; Weisse profound changes in the joints and bones. Larrey reports great mobility between the sacrum and ilium, with entire destruction of the joint, and considerable loss of substance from the sacrum and ilium. Sequestra were found in the joint by Hamilton, Verneuil, and Gounoud.

The joint may be affected primarily or secondarily.

In 22 cases in which post-mortem examinations were made, 13 seem

to have belonged to the first, and 9 to the second class. Of the latter 5 were secondary to disease of the lumbar vertebræ; in 3 cases the disease was subsequent to a phlegmonous inflammation of the pelvic fascia, and in one case it was due to disease of the ilium.

In three cases metastatic abscesses were found in the joint.

The result is given in 48 cases: 23 were cured, 1 improved, 3 remained in the same condition as when first seen, and 23 died. Of the latter 10 died from exhaustion, 3 from pyæmia, 1 from erysipelas, 1 from diarrhoea, 1 from hemorrhage from the iliac artery, 1 from phthisis, and in 6 no cause is assigned.

Of the 23 who recovered, in 9 there existed abscesses, and in 10 there was no mention made in regard to them.

Treatment.—The purpose of the sacro-iliac joint being to unite and bind together the bones of the pelvis, so as to form a firm basis of support for the body above, and for attachment of the lower extremities below, demands that there should be no motion between the constituent parts of the joint. A glance at its structure shows how perfectly this is accomplished by the strong ligaments within and without the joint. Any relaxation of this bond of union, not to mention any more profound change in the articulation, makes locomotion difficult if not almost impossible. The indications for treatment in disease of this joint are to aid nature in obtaining immobility between the bones forming its boundary. Post-mortem examination of those who had profound disease of this articulation, and who have recovered, shows the bones firmly united together, and all treatment should tend to aid nature in establishing ankylosis. In every case where the treatment is mentioned, it consisted of absolute rest in bed during the more acute stage of the disease. Later, in many cases firm support by some kind of a bandage around the pelvis so as to prevent all movement between the sacrum and ilium. Heath speaks highly of a bandage consisting of two pieces of strong inelastic webbing, starting from either side of a wooden pad placed over the symphysis pubis, one passing to the right, the other to the left, crossing behind, and after surrounding the pelvis, secured again to the pad; this should be drawn as tightly as possible. With some support of this kind patients are able to go about without any inconvenience, while without it locomotion is difficult. Sayre advocates extension by raising the sole of the shoe on the sound side so as to allow the limb on the affected side to swing, making use of it as an extending force. In Case I. extension was tried, but it had to be removed on account of the great pain it caused. The exquisite pain caused by traction on inflamed tissues in and about the joint, would make this mode of treatment impossible in many cases. Extension in disease of the hip-joint is not to separate the head of the bone from the acetabulum, but to control muscular spasm. The joint under consideration is not acted on directly by muscles as the hip-joint is, and therefore the extension would not be indicated.

Ten cases were cured by absolute rest in bed, and later by some kind of a pelvic band; eleven by simple rest; one by rest and a long splint; one by the continuous application of ice for three weeks.

In some cases the use of the actual cautery was beneficial. Tonics and good nourishment are called for in all cases of joint disease. Those cases complicated by abscesses seem to have done best when the pus was early evacuated. In cases reported recently the frequent use of the aspirator seems to have been attended with good result; but, whether free incision or the aspirator is used, the abscess cavity should be kept free from pus.

The question of attempting to remove dead bone, when it can be detected, is viewed differently by different surgeons. Mr. Erichsen states that no operation is admissible. Mr. Bryant states that he has taken a large piece of bone from this joint in a young girl with great benefit, and Sayre says that he has operated often with good result. The fact, that operations for the removal of diseased bone have been performed with benefit, would seem to indicate that they should not be condemned as strongly as they are by Mr. Erichsen. Personally, I have had no experience in operating, but would certainly make the attempt to remove diseased bone when I could satisfy myself of its presence, and I do not see how such a procedure could add to the gravity of the disease.

Diagnosis.—Sacro-iliac disease is most frequently mistaken for hip-joint disease. The diagnosis from the latter may be made by attention to the following points: The pain from sacro-iliac disease is *behind* the hip-joint, or is referred to the thigh, knee, or leg; when the pain is in the knee, the absence of other symptoms of hip disease should direct our attention elsewhere. In the early stage of sacro-iliac disease, and until the formation of intra-pelvic abscesses, in those cases complicated by them, there is *no flexion* of the *thigh* on the *pelvis* and no lordosis, while in hip disease these are *early* and *constant* symptoms. *Motion at the hip-joint* in sacro-iliac disease is *perfectly smooth, free, and painless*, when the pelvis is fixed; in hip-joint disease it is *always* limited, and, in cases at all advanced, *always painful*. In sacro-iliac disease the pelvis does not move with the thigh; in hip-joint disease it does. In sacro-iliac disease there is no pain on pressure, either below Poupart's ligament in front, or behind the trochanter major; in hip-joint disease this is a marked symptom. Pressure on the ilium, at right angles to body, or attempting to rotate this bone, always causes pain in sacro-iliac disease; in hip-joint disease it does not. In sacro-iliac disease there is always tenderness on pressure over the joint; in uncomplicated hip-joint disease there is none. In hip-joint disease of any duration there are always sudden attacks of pain at night; in sacro-iliac disease they are absent. There is no absolute shortening of the limb on the affected side in sacro-iliac disease; in the more advanced stage of hip-joint disease there is. Intra-pelvic abscesses may be an early accompaniment of sacro-iliac disease; they are only found late in hip-joint disease. Extra-

pelvic abscesses in sacro-iliac disease are *behind* the hip-joint, and there is usually a distinct sulcus between the abscess and the trochanter; in hip-joint disease the pus is found either about the joint, or in the thigh, and there is thickening of the tissues about the joint. The attitude assumed by the patient, when standing, in sacro-iliac differs from that in hip-joint disease; in the former the body is thrown on to the sound side, so as to relieve the inflamed joint from all pressure, while in the latter the thigh is flexed, and the pelvis twisted. Locomotion is more painful in sacro-iliac than in hip-joint disease, and greater relief is experienced from absolute rest in bed in the former, than in the latter disease.

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